

Research, Scholarly and Creative Activities, and Discovery (RSCAD) News

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The weekly RSCAD newsletter provides the latest research news, funding opportunities, and academic trends.

BRI Achievements

Steve Higgs writes about research and training successes at the Biosecurity Research Institute.

In the almost six years that I have been at K-State, the Biosecurity Research Institute (BRI) has continued to flourish thanks to dedicated BRI staff, institutional commitment, and exceptional researchers from several departments who have successfully pursued funding opportunities. Data from the Office of the Vice President for Research show that since 2006, funds obtained by K-State researchers that were in some way attributed to the capabilities of the BRI totaled more than \$111 million. And the parking lot is now consistently full!

Here are a few examples of research done at our facility.

- Barbara Valent, James Stack, and Christian Cruz from plant pathology lead work on wheat blast fungal disease, continuously funded at the BRI since 2009. The recent introduction of wheat blast into Bangladesh and India — the first occurrences outside of South America — emphasize the threat that this pathogen poses to worldwide crop production. Studies on *Rathayibacter toxicus*, a bacterium transmitted by nematodes to certain grass species, will begin in 2017. This plant pathogen produces a toxin that is more deadly than ricin for livestock, potentially killing those that eat the infected grass.
- For the second year in succession, the livestock research area of the BRI is at maximum capacity. Projects include studies on African swine fever, avian influenza, classical swine fever, Japanese encephalitis, Rift Valley fever, Schmallerberg, and evaluation of a vesicular stomatitis expressed Ebola vaccine. Research on chikungunya, Rocky Mountain spotted fever, yellow fever and Zika are also ongoing. Development of vaccines, diagnostics and treatments are common themes for many of the studies, with goals to save animal lives, improve detection and response

capabilities in the event of outbreaks, ensure a robust and secure agricultural system and food supply, and protect public health. These studies, several of which are funded by the State of Kansas National Bio and Agro-Defense Facility transition fund, are being conducted by faculty from the College of Veterinary Medicine, including Roman Ganta, Stephen Higgs, Scott Huang, Juergen Richt, Bob Rowland, Jishu Shi, and Dana Vanlandingham, with collaborating scientists Drolet, McVey, and Wilson from the USDA's Arthropod Borne Animal Diseases Research Unit.

- Other projects focus on mitigation of foodborne pathogens during food processing, as part of a \$25 million grant from the USDA that is directed at K-State by Randall Phebus from animal sciences and industry, plus a study on HEPA filtration monitoring by Stephen Eckels from the College of Engineering.
- In 2016, the National Agricultural Biosecurity Center relocated to the BRI, where team members are developing risk analysis and mitigation strategies to anticipate and respond to events such as foreign pathogen introduction into the U.S. NABC staff are involved in a DHS-funded national livestock readiness program and are conducting FEMA supported animal disease response training for first responders.

Training is a critical part of ensuring safe and secure work at the BRI. More than 200 people have been trained to the level of independent high-containment access, including 115 currently approved to work with the so-called select agents that are regarded by the U.S. government as the highest threat to animals, plants, and people. The BRI is now actively involved in educating undergraduate and graduate students; we have helped develop five new for-credit courses related to biosecurity, biosafety, and research on high-consequence pathogens since 2012. Other accomplishments include:

- Five trainees are currently enrolled in the DHS Research and Development Fellowships for Transboundary Animal Disease Professionals;
- In January, scientists from 11 different countries attended the week-long High Containment Laboratory Practices and Techniques course taught by BRI staff and funded by the USDA;
- In upcoming months, BRI staff will help coordinate, teach, and host a DHS-supported Center of Excellence for Emerging and Zoonotic Animal Diseases two-week summer program and a Plant Biosecurity and Practices Workshop; and
- BRI will offer a new Transboundary Animal Diseases course taught by Alfonso Torres, former director of the Plum Island Animal Disease Center, later this year.

Along with all BRI staff members and researchers, I look forward to continuing to contribute to the vigorous and collaborative research and education community at K-State. We invite you to read more about the excellent work of BRI researchers and to attend our BRI Research Fellows Lecture by Arturo Casadevall, Chair of Molecular Microbiology and Immunology at Johns Hopkins Bloomberg School of Public Health in Baltimore, on April 21 at 9:30.

— Steve Higgs